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ABSTRACT

This module on evaluation models is one of a set of five on evaluation and research and is part of a larger series of thirty-four modules constituting a core curriculum for use in the professional preparation of vocational educators in the areas of agricultural, business, home economics, and industrial education. Following the module objective and overview and a bibliography of suggested resource materials (readings) for the entire module, five lessons are presented: (1) formative evaluation; (2) characteristics of summative evaluation modes; (3) implementation of summative evaluation models; (4) criterion-referenced measurement; and (5) other evaluation measures. Each lesson contains the objective, overview, a list of suggested learning activities, and a list of suggested resources (readings). Concluding the module is a pre/posttest and an answer key. (The modules have been field tested in various educational settings, including bachelor and masters degree programs, and are considered adaptable to many instructional styles and student entry levels. CE 018 935-937 contain working papers and other materials used in the development of the module series.) (JH)

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Common Core Curriculum
for Vocational Education

G-1

EVALUATION MODELS

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Category G:

EVALUATION AND RESEARCH

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ABOUT THIS MODULAR CURRICULUM

This module is one of a series of 34 modules intended for use in the professional preparation of vocational educators in the vocational education service areas of agricultural, business, home economics, and industrial education. The curriculum can be adapted to various styles of instruction and to various entry-levels of students.

It is recommended that an instructor planning to use these modules review each category to determine if any modification is needed in the objectives and suggested activities so that they conform with local institutional policies and/or vocational education programs. It is also suggested that resources and activities be identified for the specific entry-level of the student to be served.

The activities listed are suggested. The use of any other activity or reading reference which the instructor believes would help to accomplish the objectives of that lesson is encouraged. The choice of the teacher to use the entire module, either through group reports or individualized assignment, will be related to individual student competency requirements.

Since many modules strongly recommend the use of local administrative personnel and community rsources, it is suggested that all site visitations and requests for assistance in the community be coordinated by or cleared through the instructor. The instructor may wish to distribute these tasks among the student group and across the community with the class report system being used to disseminate the information gathered.

These modules have been field tested in various settings. They have been used with students working toward a bachelor's or master's degree and with students seeking the designated subjects credential in Californica. Some modules were tested through student independent study, others as part of total class assignment, and still others as an alternate activity. Workshop participants examined the materials in terms of content, activities, and resources. The adaptability of this curriculum is one of its strengths.

The materials could not have been completed without the participation and contribution of many individuals. Chief among these persons were the module writers, workshop participants, field-test instructor, and students. Conference presentors and evaluators also contributed to this project. Proceedings of the workshop are available upon request.

If we can provide you with information or help in using this curriculum, please feel free to contact us.

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COMMON CORE CURRICULUM

FOR

VOCATIONAL EDUCATION

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EVALUATION MODELS

Module Objective

Upon satisfactory completion of this module, the vocational education student will be able to:

(1) Identify and explain the use of each evaluation model in determining effectiveness and relevancy of occupation program.

(2) Describe the criteria on which program evaluations are made.

Module Overview

Evaluation in vocational education is a process of measuring the effectiveness of the vocational education program in meeting its stated goals. These goals, given in the local plans for vocational education, are stated as objectives.

The purpose of evaluation in vocational education is to provide data for decision making for program improvement. Evaluation supports program improvement by retention of effective activities and modification or deletion of ineffective ones. When most effective, evaluation is an integral and ongoing part of every vocational education program. Therefore, evaluation looks at content, materials, facilities, instruction, supervision, administration, guidance personnel and related public agencies.

Evaluation has two important qualities: (1) evaluation must be comparative; (2) evaluation requires that program outcomes be compared with program objectives to determine program effectiveness.

The following are effective means of evaluating vocational education programs:

Formative evaluation is an ongoing-type of evaluation that is concerned with the development, revision, and modification of programs or products through the use of feedback. Examples of this type of evaluation research are: (1) evaluation of parts of the curriculum as it is being developed; (2) evaluation of the target population's characteristics; (3) evaluation of goals and objectives of the program.

Summative evaluation provides an independent assessment of the merit or worth of a program or product at completion. This decision is based on empirical evidence, such as a collection of data from which a judgment is made of the program or product. Summative evaluation attempts to "sum up" total achievement in a program by means of achievement tests given at the end of a unit of instruction.

Criterion-referenced measurement is an evaluation procedure with precisely defined objectives or domains (tasks). Students' scores on the tests function as empirically established standards of attainment instead of comparison with the performance of a reference group. Criterion-referenced tests are used to determine if a pupil has achieved a specific goal for the learning task.

This module has the following five lessons:

(1) Formative Evaluation

(2) Characteristics of Summative Evaluation Models

(3) Implementation of Summative Evaluation Models

(4) Criterion-Referenced Measurement

(5) Other Evaluation Measures

Resource Materials for Completing the Activities in this Module

American Vocational Journal, 51, No. 8, November, 1976.

Anderson, S. B.; S. Ball; and R. T. Murphy & Associations. Encyclopedia of Educational Evaluation. San Francisco: Jossey-Bass, 1975.

Apple, M. W.; M. J. Subkoviak; and H. S. Lufler, Jr. (eds.). Educational Evaluation: Analysis and Responsibility. Berkeley: McCutchan, 1974.

Block, J. H. (ed.). Mastery Learning Theory and Practice. New York: Holt, Rinehart, and Winston, 1971.

Browning, Philip L. (ed.). Evaluation of Short-Term Training in Rehabilitation. Monograph No. 3, Rehabilitation Research and Training Center in Mental Retardation. Eugene, Oregon: University of Oregon, College of Education, 1970.

Campbell, Donald T., and Julian C. Stanley. Experimental and Quasi-Experimental Design for Research. Chicago: Rand McNally, 1966.

Grobman, Hulda. Evaluation Activities of Curriculum Projects: A Starting Point. American Educational Research Association Monograph Series on Curriculum Evaluation. Chicago: Rand McNally, 1968.

House, E. R. (ed.). School Evaluation, the Politics and Process. Berkeley: McCutchan, 1973.

Lecht, Leonard A. Evaluating Vocational Education--Policies and Plans for the 1970s. New York: Praeger, 1974.

Lendvall, C. M., and R. C. Cox. Evaluation as a Tool in Curriculum Development: The IPI Evaluation Program. Chicago: Rand McNally, 1970.

Popham, W. J. An Evaluation Guide-book. Los Angeles: The Instructional Objective Exchange, 1972.

Popham, W. J. (ed.). Criterion-Referenced Measurement. Englewood Cliffs, New Jersey: Prentice-Hall, 1971.

Popham, W. J. (ed.). Evaluation in Education. Berkeley: McCutchan, 1974.

Popham, W. J. Evaluating Instruction. Englewood Cliffs, New Jersey: Prentice-Hall, 1973.

EVALUATION MODELS

Lesson One: Formative Evaluation

Objective

Upon satisfactory completion of this lesson, the student will be able to explain in writing the procedures which should be followed to evaluate the effectiveness and relevancy of instruction in an occupational program.

Overview

Formative evaluation is an on-going type of evaluation that is concerned with the development, revision, and modification of programs through the use of feedback. Data is collected and judgments are then made to improve instruction as it is undergoing development.

Formative devices on tests have been developed to determine, for example, how much students have learned in a particular content area and then to assess the effectiveness of the instructional methods used.

In this lesson the student will become familiar with some of the monitoring and assessment devices used in formative evaluation.

Suggested Activities

(1) Compare in writing the "Monitoring Activities of Formation Evaluation," Evaluation as a Tool in Curriculum Development by C. M. Lindvall and R. C. Cox with Baker's definition of formative evaluation as prescribed in Evaluation in Education, 1974, p. 531. What are the commonalities and what are the elements that differ?

(2) Develop a simple assessment device for a selected unit from a curriculum guide or a course of study to be used in a specific area of study as formative evaluation.

(3) Prepare an audio-visual device to be used as a formative evaluation device.

(4) Devise a monitoring plan for evaluating one aspect of a vocational program for your specific area.

Suggested Resources

Anderson, S. B.; S. Ball, R. T. Murphy & Associates. Encyclopedia of Educational Evaluation. San Francisco: Jossey-Bass, 1975.

Baker, E. L. "Formative Evaluation of Instruction." In W. J. Popham (ed.). Evaluation in Education. Berkeley: McCutchan, 1974.

Block, J. H. (ed.). Mastery Learning: Theory and Practice. New York: Holt, Rinehart, and Winston, 1971.

Lindvall, C. M., and R. C. Cox. Evaluation as a Tool in Curriculum Development: The IPI Evaluation Program. Chicago: Rand McNally, 1970.

Upon successful completion of assigned activities, proceed to Lesson 2.

EVALUATION MODELS

Lesson Two: Characteristics of Summative Evaluation Modes

Objective

Upon satisfactory completion of this lesson, the student will be able to (1) identify the positive and negative factors which may influence the programs/outcomes; (2) discuss the program objectives as related to the design; (3) select appropriate evaluation designs to use with vocational education programs; and (4) identify and discuss the commonalities that would be appropriate for vocational education evaluation.

Overview

Summative evaluation is used in vocational education to measure the overall effectiveness of a program. The impact of the program is often determined by evaluation of the intended and the unintended goals of the program. The evaluator will have to be concerned with sampling, test selection, design of evaluation, and statistical analysis. The product of the summative research is a report which indicates areas of program success as well as areas of program failure.

Suggested Activities

(1) Describe the difficulties that may be encountered in attempting to implement an evaluation study. Design a summative evaluation device which would overcome restraints.

(2) Select two of the "evaluation designs" as explained in studies in Popham's Evaluation in Education. Give reasons why you prefer these two for vocational education evaluation.

(3) Prepare a chart or other visual aid showing the differences and commonalities between the two evaluation designs you selected.

(4) Design a summative evaluation for a unit of study in vocational education.

Suggested Resources

Anderson, Scarvia B.; S. Ball; and R. T. Murphy & Associates. Encyclopedia of Educational Evaluation. San Francisco: Jossey-Bass, 1975.

Lecht, Leonard A. Evaluating Vocational Education-Policies and Plans for the 1970s. New York: Praeger, 1974.

Popham, W. J. (ed.). Evaluation in Education. Berkeley: McCutchan, 1974

Upon successful completion of assigned activities, proceed to Lesson 3.

EVALUATION MODELS

Lesson Three: Implementation of Summative Evaluation Models

Objective

Upon satisfactory completion of this lesson, the student will be able to (1) evaluate a vocational education program using a Product Evaluation Profile; (2) identify similarities and differences in the formative and summative evaluation models, and give an example of when and where each evaluation model is used; and (3) describe internal and external validity of evaluation and threats to validity.

Overview

Summative evaluation is an efficient, usually accurate, and reliable means of evaluating products, producers, and proposals.

In any design of evaluation, internal validity must be checked. Threats to internal validity, according to Donald Campbell in Experimental and Quasi--Experimental Design for Research and others, are:

(1) History: events external to the program, policy, or practice under investigation which occur between pre- and posttesting.

(2) Maturation: Natural biological, psychological, or sociological development of subjects occurring between pre- and posttesting.

(3) Instability: unreliability of measures, which cause fluctuation in scores independent of the program, policy, or practice under investigation.

(4) Testing: the effect of taking a test at one point in time upon taking the same test at a subsequent point in time.

(5) Instrumentation: the effect of changes in the measuring instrument between pre- and posttests so that observed effects are a result of the instrument change and not the program, policy, or practice.

(6) Selection: biases resulting from differences between types of individuals recruited for comparison groups.

(7) Mortality: differential loss of subjects from comparison groups.

(8) Statistical regression: the effect of selecting individuals on the basis of their extremely high or extremely low scores on a measuring instrument. Scores at extreme ends of a distribution are unreliable and retesting tends to result in either extremely high scorers scoring relatively lower and hence regressing downward in test scores or extremely low scorers scoring relatively higher and hence regressing upward in test scores.

Suggested Activities

(1) Identify the value of the thirteen items on Scriven's checklist for the evaluation of products, producers, and proposals in vocational education. Popham, Evaluation in Education, 1974, Chapter 1.

(2) Develop a PEP (Product Evaluation Profile) using a vocational education proposal or program that is available to you. Identify the strengths and the weaknesses of a program according to the profile charted.

(3) Find a case study or ask a counselor for examples of case studies in which the validity was threatened by one of the conditions listed by Donald Campbell. Analyze one case study for presentation to the class or instructor.

(4) Explain in writing how each threat to internal validity might be controlled or eliminated through plausible explanations if the results of the evaluation studies are to be considered valid.

Suggested Resources

House, E. R. (ed.). School Evaluation, the Politics and Process. Berkeley: McCutchan, 1973.

Popham, W. J. (ed.). Evaluation in Education. Berkeley: McCutchan, 1974.

Upon successful completion of assigned activities, proceed to Lesson 4.

EVALUATION MODELS

Lesson Four: Criterion-Referenced Measurement

Objective

Upon satisfactory completion of this lesson, the student will be able to (1) explain when a criterion-referenced evaluation tool is relevant and effective for evaluation of a vocational program; (2) state the difference between a norm-referenced test and a criterion-referenced test when used for a decision regarding individuals or programs; and (3) explain the effectiveness and relevancy of domain-referenced tests (DRT) and differential assessment devices (CRDAD).

Overview

Criterion-referenced (CR) tests provide information about the specific knowledge and skills needed in order to make decisions about instructional programs. Criteria in the CR test scores refer to specific tasks a student must be capable of performing before one of the established knowledge levels is reached.

A domain-referenced test (DRT) consists of a stratified random sample of items selected from a defined set of tasks or domain.

A differential assessment device (CRDAD) differentiates students who have a given capability defined by their choice of criterion groups.

Suggested Activities

(1) Write a comparison of the basic differences between a norm-referenced test and a criterion-referenced test as used for decisions in evaluation of programs.

State in writing how the norm-referenced test results are used and when the criterion-referenced test results are more valuable for evaluation methods.

(2) Explain in writing the value of each of the following in the reporting and interpreting of evaluation measurement results.

a. Variability
b. Item construction

c. Reliability
d. Validity
e. Item analysis

(3) Identify in writing the characteristics of a Domain-Referenced Test (DRT) and a Differential Assessment Device (CRDAD) Test used to make criterion-referenced inferences according to:

a. Content limitations of the items
b. Item selection procedures
c. Item test variance required
d. Types of reliability
e. Primary type of validity
f. Nature of the criterion groups
g. Inference most appropriate about Examinees' levels of functioning and Examinees' differential capabilities.

See Popham, Evaluation in Education, 1974, p. 318.

Report your conclusions concerning the vocational education evaluator's uses of DRT and CRDAD in writing or in a small group discussion.

(4) Develop and/or select a criterion-referenced test as a pretest or level of assessment for skills necessary in areas such as typewriting, horticulture, basic auto mechanics, or child development studies.

Suggested Resources

Popham, W. J. (ed.). Criterion-Referenced Measurement. Englewood Cliffs, New Jersey: Prentice-Hall, 1971.

Popham, W. J. (ed.). Evaluation in Education. Berkeley, California: McCutchan, 1974.

Upon successful completion of assigned activities, proceed to Lesson 5.

EVALUATION MODELS

Lesson Five: Other Evaluation Measures

Objective

Upon satisfactory completion of this lesson, the student will be able to identify the methodology for program evaluation used in the major studies described by Stromsdorfer's report. (See Lecht, Evaluating Vocational Education--Policies and Plans for the 1970's, 1974, p. 70.)

Overview

Most of the evaluation of vocational education has been in the form of cost-benefit analysis. Ernst Stromsdorfer defines this as quantitative analysis designed to provide a criterion or standard for decision-making to allocate, rationally and optimally, a given set of scarce resources among numerous competing needs.

Success of a program for vocational education has traditionally been stated in terms of completions and placements of graduates of the program. There has been a lack of records on other worthwhile outcomes from the programs such as earnings and duration of employment, how a graduate values leisure, job status, and job security. Therefore, a benefit from the program could be defined as any result that increases individual or social well-being or welfare (either economic or noneconomic).

Suggested Activities

(1) After studying table 6.1, shown in Lecht, Evaluating Vocational Education--Policies and Plans for the 1970s, 1974, p. 77 explain in writing what conclusions may be drawn from the question, "Do graduates of secondary programs find worthwhile earnings and employment?"

(2) According to the National Longitudinal Surveys, which students of vocational education benefit the most from this education and in what ways do these students benefit? (See Lecht, 1974.) Discuss this report with your peers and give a written report to the instructor.

(3) From your discussion of the above report, identify in writing as many data as you think would be valuable for use in preparing a vocational education proposal.

Suggested Resources

Lecht, L. A. Evaluating Vocational Education--Policies and Plans the 1970's. New York: Praeger, 1974.

Upon completion of the assigned activities in this module, you should be ready to take the Module Posttest. See you instructor for directions and measurement criteria.

EVALUATION MODELS

PRE/POSTTEST

Student_____

Instructor_____

Date_____

Student:	This pre/posttest is designed to assess your knowledge of evaluation models. Since this module is an individualized and competency-based learning device, you will need to study only those lessons that are presented on the basis of your response to this test.

1. Define evaluation.

2. Distinguish between formative and summative evaluation measures.

3. Explain the monitoring activities of formative evaluation according to Lindvall and Cox, Education as a Tool in Curriculum Development: The IPI Evaluation Program, 1970, p. 5.

4. What type of evaluation is best to use when writing a book or developing a curriculum guide.

5. What is the purpose of evaluation design?

Pre/posttest (continued)

6. Some factors which contribute to ambiguity in evaluation may be controlled by design. Name eight factors that might affect the results of internal validity and that may be controlled in the evaluation design.

   a.

   b.

   c.

   d.

   e.

   f.

   g.

   h.

7. What are the two major procedures in evaluation design used to overcome threats to internal validity?

8. Describe the purpose of criterion-referenced measurement.

9. Explain the purpose of norm-references.

Return this test to your instructor.

EVALUATION MODELS

ANSWER KEY
MODULE PRE/POSTTEST

Instructor:	Do not reproduce this page in students' booklets. You must retain it for grading and prescriptive purposes. Answers will vary with individuals. A preferred response might be similar to the answer presented.

1. (L1) Evaluation consists of an assessment of merit, a judgment of worth, and a supplying of information to aid decision makers.

2. (L1, 2,3) Formative evaluation utilizes information collected and improves instruction as it is undergoing development. Feedback is necessary for program revisions and modifications.

Summative evaluation is used to validate the program upon completion and usually involves the use of comparative data concerning the overall worth of the program in relation to similar programs.

3. (L1) The monitoring activities of formative evaluation are as follows:

a. What goals should the program achieve?
b. What is the plan for achieving these goals?
c. Does the operating program represent a true implementation of the plan?
d. Does the program, when developed and put into operation, achieve the desired goals?

4. (L1) Formative evaluation is best to use when writing a book or developing a curriculum guide.

5. (L2) The purpose of an evaluation design is to facilitate gathering data, thereby making possible valid statements about the effects or outcomes of the program, practice, or policy under study.

6. (L2, 3) Eight factors that may affect the results of internal validity are:

a. History
b. Maturation of student
c. Instability of measures
d. Testing
e. Instrumentation - pre/posttest
f. Selection of participants
g. Mortality of subjects
h. Statistical regression

7. (L3) Two major procedures in evaluation design used to overcome threats of ambiguity to internal validity are:

Pre/posttest Answer Key (continued)

a. Control or comparison groups
b. Randomization

8. (L4) The purpose of criterion-referenced measurement is to ascertain an individual's status with respect to some criterion or performance standard.

9. (L4) Norm-reference ascertains an individual's performance in relation to another's; the scores are useful only in comparison with the scores of others taking the same test. Any test could yield norm-referenced interpretations.

MODULES -- COMMON CORE CURRICULUM FOR VOCATIONAL EDUCATION

Category A: Introduction to Vocational Education

- A-1 History, Philosophy, and Trends in Vocational Education
- A-2 Scope, Function, and Organization in Vocational Education
- A-3 Vocational Legislation
- A-4 Assessing the Job Market and Employment Trends

Category B: Cooperative Relationship

- B-1 Rationale for Cooperative Relationships
- B-2 Advisory Councils
- B-3 Cooperative and Work Experience Programs

Caregory C: Vocational Students

- C-1 Promoting Vocational Education and Recruiting Eligible Students for Vocational Education
- C-2 Assessing Students' Personal Characteristics
- C-3 Guidance and Counseling
- C-4 Assisting Students with Special Needs in Vocational Education Program
- C-5 Assessing the Needs of the Disadvantaged Student
- C-6 Developing Student Leadership Qualities in Vocational Education Programs
- C-7 Student Organizations

Category D: Administration and Supervision

- D-1 Fiscal Management of a Vocational Education Program
- D-2 Writing a Vocational Education Project/Budget
- D-3 Record Keeping in Vocational Programs
- D-4 Conference Leadership
- D-5 Selection, Supervision, and Evaluation of Personnel
- D-6 School Law and Its Relationship to Vocational Education
- D-7 Staff Development
- D-8 Implementation of Change

Category E: Curriculum Design in Vocational Education

- E-1 Developing a Curriculum Design in Vocational Education
- E-2 Applying Learning Theory to Vocational Education
- E-3 Instructional Strategies

Category F: Stages and Structure of Curriculum Development

- F-1 Theories in Curriculum Development
- F-2 Building a Curriculum for Vocational Education
- F-3 Applying Curriculum Specifics to Vocational Education
- F-4 Safety

Category G: Evaluation and Research

- G-1 Evaluation Models
- G-2 Evaluation Procedures for Local Programs
- G-3 Introduction to Research Procedures in Vocational Education
- G-4 Research Design in Vocational Education
- G-5 Development of a Research Proposal in Vocational Education